

# **Description of the sampling sites along the River Someş/Szamos<sup>1</sup>**

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## ***Introduction***

The research of the River Someş was accomplished during two field campaigns organised by the Tisza Klub, Szolnok (Hungary) and the Pro Europa League, Târgu Mureş (Romania). During the first trip between 15-30 July of 1992 a preliminary examination of the river system was carried out in order to select the sampling sites. Travelling along the rivers, 16 sites were selected, taking into account the geological, geographical and hydrological features, and the main sources of pollution. The sampling sites were localised both upstream and downstream the main localities, in order to assess the effects of pollution. The sampling campaign took place between 1-22 August of 1992. The team was formed by specialists from different fields: chemists, pedologists, geologists-sedimentologists and biologists. The River Someş have different characteristics from other rivers and these are also emphasised by specific anthropogenic influences.

Between 1-21 August of 1996 the expedition was repeated almost with the same specialists and with some new ones.

Students from the Babeş-Bolyai University of Cluj, Lucian Blaga University of Sibiu and from the University of Bucharest also contributed to the success of the research work carried out in these two years. Many of the students wrote their diploma work on the basis of this study. Some of them have become specialists in the field and now they present their original results in this volume.

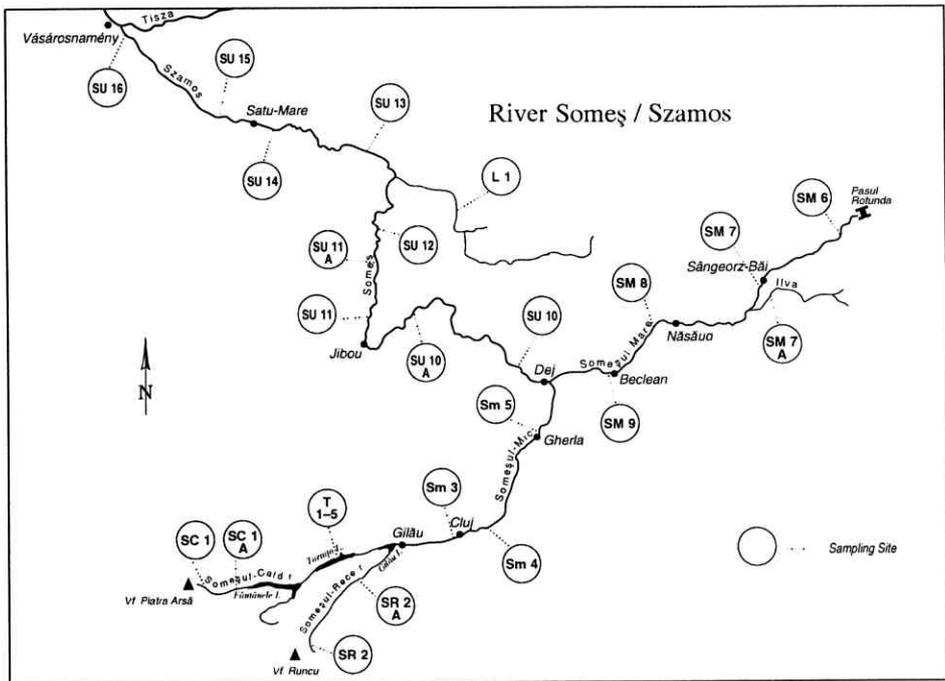
## ***Codes and descriptions of the sampling sites (see Map)***

### **River Someşul Cald/Meleg Szamos**

#### **Site SC 1 - Ic Ponor**

The Someşul Cald comes to the surface from an endocarstic system at the entrance of the Cetaşile Rădesei Cave. After flowing through it the river enters the Someşul Cald gorges (Bazarul Someşului). The flow is very fast between these high walls formed by Triassic limestone and fill pits here and there. The average depth is about 0,10-0,20 m. At the level of the sampling site (after coming out from the gorges) the width of the riverbed is 5 m, on a bed formed by boulders and pebbles, in a coarse sandy matrix.

<sup>1</sup> The first name is Romanian, and the second Hungarian



#### Site SC 1 A - upstream of Smida

About 5 km downstream the gorges of the Someșul Cald the width of the bed is 15 m, with a depth of 0,20-0,50 m. The bed consists of rounded pebbles, on a coarse sandy matrix. The valley is larger, forming a mountainous plain in the river valley with terraces. The lower terrace is of 2,5 m, while the upper one is about of 6 m over the water level. The stream is crossed with artificial dams for trout.

#### The dam-lakes on the Someșul Cald/Meleg Szamos

The Someșul Cald river has three dam-lakes as it follows: Beliș, Tarnița and Gilău, the latter one capturing also the water from the river Someșul Rece. In 1996 only the Tarnița lake was studied, at the following places:

##### Site T 1 - Someșul Cald valley upstream the lake

The riverbed is about 5-6 m wide, and the depth is 0,20-0,40 m. The river keeps its typical mountainous aspect.

##### Site T 2 - The flowing zone into the lake

On the bank there are stones and boulders with coarse sand, fine deposits loaded with detritus here and there.

Site T 3 - Water samples were collected from the surface almost at half way of the lake and also samples of sediments and of benthos from a depth of 46 m with a Van Veen

dredge. We tried to take out samples from the bottom, and the dredge rarely brought pieces of rocks to the surface or it did not bite anything. Only one of the 15 samples consisted of fine and silty sediments. Rocks form the greater part of the bottom.

Site T 4 - It is situated at the right side of T3, at a distance of 3 m from the bank. The depth is about 15 m, and the sediments are formed by fluid mud of greyish-brown colour, with detritus.

Site T 5 A - 200 m up to dam were collected plankton samples. Average depth of this sampling site was 60 m.

### **River Someșul Rece/Hideg Szamos**

Site SR 2 - upstream the Blăjoaia cottage

The average width of the river is of 3 m, and its depth is of 0,15-0,40 m. Near the banks there is a terrace of 1-1,2 m, on which a Sphagnum bog develops, forming a thick layer of peat. The river meanders through the bog. Towards the Blejoaia cottage small waterfalls are formed against trout. The riverbed consists of boulders and pieces of rocks, disposed on coarse sand. Downstream there is a dam-lake silted up with fine sediments.

Site SR 2 A - situated at 7 km downstream Blejoaia, where the bed is of 10 m wide and of 0,10-0,15 m deep, with rocks and rounded gravels disposed on a fine sandy matrix.

There are two dams stopping the course of the water, the water led through underground tunnels into the dam-lakes from Someșul Cald Valley. In this way the river disappears twice, its bed remains dry. Downstream it is formed again by several brooks.

### **River Someșul Mic/Kis Szamos**

Site Sm 3 - upstream Cluj, near Fântânile Clujului.

The riverbed is about 20-25 m wide, and of 1,20-1,30 m deep, being formed by coarse limestone's, the layer of which bend against the flow, consequently their heads have the aspect of ripple Marks. The bed in lothic zones is formed by gravels and in the neighbourhood of banks by muddy layers.

Site Sm 4 - downstream Cluj at the level of Someșeni village

The riverbed was straightened and enclosed between concrete walls. The riverbed is bouldery, towards the banks there are also muddy layers. The stones are covered with biotecton and filamentous algae. The water is overloaded with organic matter from communal and industrial wastewater. On the banks there are deposits of garbage, brought both by the locals and high-waters.

Site Sm 5 - downstream Gherla

It can be stated that the quality of the water is very low, having a black colour and an stinking smell. The flow is slower but in the middle it keeps rapid. The bed is gravely

and pebbly. Toward the banks there are very thick layers of decaying organic mud, releasing H<sub>2</sub>S. The water is full of submerged vegetation which indicates a high degree of trophity. The benthos is dominated by masses of Oligochaeta, proving an excessive saprobity.

### **River Someșul Mare/Nagy Szamos**

Site SM 6 - at the confluence with the Arin brook

The river has a mountainous aspect with a width of 5-7 m, and a depth of 0,20-0,70 m. The speed of flow is 1,3-1,4 m/s. The riverbed is formed by rounded boulders and pebbles on a sandy layer.

Site SM 7 - downstream Sângeorz Băi.

The valley has the shape of an alluvial plain. The banks are formed by small islands of coarse sand, the width being about 10-12 m, with a depth of 0,40-0,70 m. The bed is full of boulders and pebbles.

Site SM 7 A -**River Ilva**

As the Someșul Mare is polluted from Șanț (downstream SM 6) with wastewater of mines, we tried to search for a tributary having a similar fauna to that of the former river. This comparison was not viable as the Ilva river has totally different geological characteristics, flowing on Helvetian sandstone plaques, being also polluted by communal wastewater and sawdust. Thus the lothic fauna is particular and totally different from that of the Someșul Mare. The sampling site was situated about 3 km above its confluence, where the width of the river is 10-15 m, and its depth is 0,10-0,15 m. The bed is consisted of pebbles with sand, on a grindstone plaque.

Site SM 8 - downstream Năsăud

The sampling station is situated 500 m downstream the rubbish dump of the town. This dump, situated on the riverbank, was flooded by the highwaters in February 1996. The riverbed is 30-40 m wide, with an average depth of 0,30-0,60 m, and pebbly. The height of the first terrace is of 2,5 m.

Site SM 9 - downstream Beclean

The width of the river is about 40-45 m and the depth if 0,50-1,0 m. The bed is formed of pebbles in a matrix of coarse sand and granule.

### **“United” Someșul/Szamos**

Site SU 10 - downstream of Dej

The “united” Someșul is formed by the confluence of the Someșul Mare and the Someșul Mic. At this site the valley is wider, the riverbed has a width of 40-50 m and it flows on a layer of gravel disposed in sand. The first river terrace is in a height of about 2,5-3 m. The quality of the water and sediments is very low, because of the residual waters brought by the two rivers and the wastewater discharged at Dej. Along the riverbed there are thick and wide layers of decomposed mud, overcharged with organic matter.

#### Site SU 10 A-Letca

The valley of the river is surrounded by steep slopes. However, the bed widens to 60 m, the water is 1,6 m deep. It is formed by rounded pebbles disposed on medium-sized sand of greyish-black colour. In the lenithic zones there are thick layers of organic mud. The stones are overlaid with biotecton loaded with organic matter, which forms an sticky layer. The water has an unpleasant smell and has a brownish colour. There are some lothic zones which supplies the water with dissolved oxygen.

#### Site SU 11 - Someş Odorhei

The river is about 100 m wide, with a varying depths of 0,80-0,90 m. The flow of the water is turbulent and rapid, in a bed of rounded pebbles on a sandy bottom. Although the water still contains waste from the upstream sources, an obvious improvement can be observed due to the fast and turbulent course and to the low depths. The appearance of some stenobiotic groups, such as the Bryozoa, is a good proof of this. The thick layers of organic mud disappear, towards the bank the sediments being formed by fine sand.

#### Site SU 11 A - Țicău

Although at this level, the valley forms a small gorge, there are zones with low slopes, where the flow is slow. Here and there steps appear causing a more turbulent flow. The average width of the bed is about 130 m, with a varying depth of 0,30-1,50 m. The pebbles imbedded in the sandy bottom do not allow the survival of the benthic species on the inferior parts. Since the polluting sources miss from Dej up to this level, the self-purification of the water takes place to a certain extent. Between Cășei and this reach the bacterial decomposing activity is prevailing, but their role will be taken over by other groups, such as Bryozoa and the Unionidae. Although sometimes on the surface of the water foam patches appear, indicating only a partial improvement of the quality of this river.

#### Site SU 12 - Sălsig

Leaving the gorge the Someş river meanders through a wide flood area, consisting of islands constituted by alluvial sediments. The depth is about 0,70-0,80 m, flowing on a gravely bottom. The quality of the water remains approximately similar to that of the gorge.

#### Site L 1 - River Lăpuș

The bed was studied in the Lăpuș gorge, at 1,5 km downstream the confluence with the Cavnic rivulet. In this small gorge the river forms deeper holes enclosed between rocky formations, while in wider sections flows faster in a pebbly and bouldery bed.

#### Site SU 13 - Pomi

The banks are of different height. The left bank and the middle of the bed is full of pebble deposits, and the right one shelters massive layers of black mud. The water is highly polluted due to several factors. About 7-8 km upstream the sampling site the Lăpuș river flows into the Someş and collects the Cavnic and Săsar tributaries. The former brings the residual water of mines and the latter is loaded with heavy metals discharged by the factories from Baia Mare. Consequently, the fauna is getting poorer and poorer.

#### Site SU 14 - Păulești

From this level the river gets into the Pannonic Plain. The river flows within dams built near the riverbed. The bed is formed by coarse sandy deposits of 0,7-2 cm in diameter. The quality of the water has slightly improved, but the slow flow does not help the process of self-purification. The biotope is not proper to sustain a stable community of benthos that could help this process.

#### SiteSU 15 Vetis

Upstream Satu Mare the river is straight and dammed. Sandy deposits form the left bank, and the right one is artificially paved with boulders disposed on a layer of silt. These stones make possible the existence of a benthic fauna, while the silt and the wood fallen into the water shelter communities of insect larvae. The terrace is about 4-5 m tall but the high-waters often flood over them. The quality of the water decreased because of discharges of industrial waste-waters from Satu Mare.

#### Site SU 16 Vásárosnamény

The station is situated at 200 m upstream of the confluence with the River Tisza. The bed is surrounded by high dams, covered with gallery forests. Along the riverbanks, especially inside the meanders, there are sandy beaches. The bed consists of fine sand with huge amounts of brownish-grey mud. The bed is narrower but much deeper and the river leads its way through the alluvial sediments of the Tisza plain. The quality of the water between Satu Mare and the confluence with the Tisza is very low. Here the water is opaque not only because of the sediments but first of all because of the suspensions from the polluted waters.

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